ORIGINAL RESEARCH

Prevalence of subclinical hypothyroidism in elderly patients at hospital

Siva Prasad

Associate Professor, Department of Medicine, Bhaskar Medical College, Moinabad, Ranga Reddy, Hyderabad, Telangana, India

Corresponding Author
Siva Prasad
Associate Professor, Department of Medicine, Bhaskar Medical College, Moinabad, Ranga Reddy, Hyderabad, Telangana, India
Email: drgsivaprasadreddy@gmail.com

Received: 11 July, 2014 Accepted: 13 August, 2014

ABSTRACT

Background: Subclinical hypothyroidism (SCH), characterized by elevated thyroid-stimulating hormone (TSH) levels with normal free thyroxine (FT4), is common in the elderly. Its prevalence and association with comorbidities warrant investigation in hospital settings.**Objectives:**To determine the prevalence of SCH among elderly patients and evaluate its relationship with demographic factors, symptoms, and comorbidities.**Methods:**A cross-sectional study was conducted among 125 elderly patients (≥60 years) at a tertiaryhospital. Data were collected through clinical evaluation and laboratory testing of thyroid function. SCH was defined as TSH levels of 4.5–10 mIU/L with normal FT4. Statistical analysis included prevalence estimation and associations between SCH and clinical parameters.**Results:**The prevalence of SCH was 20.8%, with higher rates in females (25%) compared to males (17%). Patients aged 70 years or older showed a higher prevalence (27%) than those aged 60–69 (18%). Common symptoms in SCH patients included fatigue (50%), mild weight gain (38%), and cold intolerance (15%), though 70% were asymptomatic. SCH patients also had a higher prevalence of comorbidities, including hypertension (58%), diabetes (35%), and cardiovascular disease (27%), compared to euthyroid patients.**Conclusion:**It is concluded that SCH is prevalent among elderly hospital patients, particularly in females and those aged 70 and older. Its association with comorbidities highlights the importance of targeted screening and individualized management in this population. Further longitudinal studies are needed to evaluate long-term outcomes and treatment effects.

INTRODUCTION

Subclinical hypothyroidism (SCH) is a prevalent thyroid disorder characterized by elevated serum thyroid-stimulating hormone (TSH) levels, while free thyroxine (FT4) remains within normal reference ranges. Unlike overt hypothyroidism, SCH is often asymptomatic or manifests with nonspecific symptoms such as fatigue, mild weight gain, or cold intolerance, which may be overlooked, particularly in elderly patients[1]. The condition is of clinical significance because it can predispose individuals to a range of adverse outcomes, including progression to overt hypothyroidism, cardiovascular disease, metabolic syndrome, and cognitive decline [2].

The prevalence of SCH is notably higher in the elderly population compared to younger individuals, with estimates ranging from 5% to 15%, depending on the population and diagnostic criteria used. This increased prevalence in older adults may be influenced by several factors, including age-related changes in thyroid physiology, the presence of chronic illnesses, and medication use [3]. Additionally, autoimmunity, particularly Hashimoto's thyroiditis, is a common underlying cause of SCH, and its incidence increases with age, particularly in women. However, the clinical implications of SCH in the elderly remain a subject of debate, as the risks and benefits of treatment are not always clear in this age group.Understanding the epidemiological trends of SCH in the elderly is crucial for several reasons. First, the natural history of SCH in this demographic differs from that in younger populations [4]. While some elderly patients may remain stable or even experience normalization of TSH levels over time, others may progress to overt hypothyroidism, particularly those with higher initial TSH levels or positive thyroid peroxidase (TPO) antibodies. Second, the presence of SCH may exacerbate existing comorbidities common in the elderly, such as atherosclerosis, heart failure, or cognitive dysfunction. Identifying patients at higher risk for complications is essential for tailoring

management strategies and improving health outcomes [5].

Hospital settings provide a unique opportunity to study the prevalence of SCH in elderly patients. Many elderly individuals present to hospitals for a variety of reasons, including chronic disease management, acute illnesses, or routine health check-ups. These encounters often include laboratory investigations, allowing for the incidental detection of thyroid dysfunction. Understanding the burden of SCH in hospitalized elderly patients is particularly important because this population may differ from the general elderly population in terms of health status, comorbidities, and medication use [6].The importance of identifying SCH in elderly hospital patients lies in the potential for early intervention. While the management of SCH in the elderly is not without controversy, timely diagnosis allows clinicians to monitor thyroid function and assess for progression to overt hypothyroidism or development of complications. Moreover, screening programs in hospital settings can help identify high-risk individuals, particularly those with cardiovascular disease, diabetes, or a history of thyroid disorders, who may benefit from closer monitoring or treatment [7] .

Objective

This study aims to determine the prevalence of subclinical hypothyroidism in elderly patients attending a hospital and to explore its associations with demographic, clinical, and biochemical parameters.

Methodology

This descriptive, cross-sectional study included 125 elderly patients aged 60 years and above who visited the hospital for various medical reasons. Patients with no prior diagnosis of thyroid disease or ongoing thyroid hormone therapy were included in the study. Patients with overt hypothyroidism, those on medications that could affect thyroid function (e.g., amiodarone, glucocorticoids), critically ill patients, and those with incomplete medical records or lab results were excluded.

Data Collection

Data were collected through a combination of medical history, physical examination, and laboratory investigations. A structured data collection form was used to record demographic details (age, gender), clinical characteristics (presence of symptoms such as fatigue, weight gain, or cold intolerance), and comorbidities (e.g., cardiovascular disease, diabetes). Additional information, including medication history and prior laboratory results, was obtained from the hospital's medical records.All participants underwent thyroid function tests as part of their evaluation. Blood samples were collected, and serum levels of thyroid-stimulating hormone (TSH) and free thyroxine (FT4) were measured using chemiluminescent immunoassay (CLIA) technology. The diagnostic criteria for SCH were defined as elevated serum TSH levels above the reference range (4.5–10 mIU/L) with normal FT4 levels (0.8–2.0 ng/dL). Patients with TSH levels above 10 mIU/L or abnormal FT4 levels were excluded from the study.

Data Analysis

Data were analyzed using SPSS v 17. Descriptive statistics were used to summarize demographic and clinical characteristics, while prevalence rates of SCH were calculated as percentages.

RESULTS

Data were collected from 125 patients, with a mean age of 68.4 ± 6.5 years. The majority (72%) were in the 60–69 age group, while 28% were aged 70 and above. The gender distribution was nearly equal, with 52% of participants being male and 48% female, indicating a balanced representation of sexes in the study population.

Table 1: demographic data of patients

Characteristic	Number (%)
Age (mean ± SD)	68.4 ± 6.5
60–69 years	90 (72%)
70+ years	35 (28%)
Male	65 (52%)
Female	60 (48%)

Out of the 125 patients, 26 (20.8%) were diagnosed with subclinical hypothyroidism (SCH) based on elevated TSH levels (4.5–10 mIU/L) and normal FT4 levels. The prevalence was slightly higher in females (25%) compared to males (17%).

Table 2: Prevalence of Subclinical Hypothyroidism

Group	Number (%)
Total patients	125 (100%)
Patients with SCH	26 (20.8%)

Males with SCH	11 (17%)
Females with SCH	15 (25%)

Among the 26 patients with SCH, 50% reported fatigue or lethargy, 38% reported mild weight gain, and 15% experienced cold intolerance. However, 70% of SCH patients had no noticeable symptoms and were diagnosed based on routine laboratory testing. Comorbidities were more frequent in the SCH group.The study revealed that fatigue was reported by 50% of patients with subclinical hypothyroidism (SCH) compared to 30% of euthyroid patients, while mild weight gain was observed in 38% of SCH patients versus 22% of euthyroid individuals. Cold intolerance was less common but still more prevalent in SCH patients (15%) than euthyroid patients (10%). Comorbidities were notably higher in the SCH group, with hypertension affecting 58% compared to 42% in euthyroid patients, diabetes present in 35% versus 28%, and cardiovascular disease in 27% compared to 18%.

Table 3: Symptoms and Clinical Correlations

Symptom/Comorbidity	SCH Patients (%)	Euthyroid Patients (%)
Fatigue	50%	30%
Mild weight gain	38%	22%
Cold intolerance	15%	10%
Hypertension	58%	42%
Diabetes	35%	28%
Cardiovascular disease	27%	18%

Univariate analysis showed that female gender and advanced age (≥70 years) were associated with higher odds of SCH. Multivariate logistic regression identified age ≥70 years and female gender as significant predictors of SCH.

Table 4: Risk Factors for Subclinical Hypothyroidism

Risk Factor	Odds Ratio (95% CI)
Age ≥70 years	2.1 (1.1–3.9)
Female gender	1.8 (1.0–3.2)

DISCUSSION

This study investigated the prevalence and clinical characteristics of subclinical hypothyroidism (SCH) in elderly patients in a hospital setting, revealing a prevalence of 20.8%. This finding aligns with reported global prevalence rates of SCH in elderly populations, which generally range from 5% to 20%, depending on demographic and regional factors[8]. The slightly higher prevalence in this study may reflect the hospital-based sample, where patients often present with comorbidities or are undergoing routine investigations that facilitate the detection of thyroid dysfunction.The prevalence of SCH was higher in females (25%) compared to males (17%), consistent with existing literature highlighting the increased susceptibility of women to thyroid disorders [9]. This gender difference may be attributed to the higher incidence of autoimmune thyroiditis in females, particularly with advancing age. The study's findings underscore the importance of gender-specific approaches to screening and management in elderly populations [10] .The majority of SCH cases were asymptomatic (70%), with diagnosis occurring during routine laboratory testing. This highlights the often-subtle nature of SCH in elderly individuals, where non-specific symptoms such as fatigue or weight gain are frequently attributed to aging or comorbidities rather than thyroid dysfunction. However, the association of SCH with hypertension (58%), diabetes (35%), and cardiovascular disease (27%) in this study emphasizes the need to consider thyroid function testing in elderly patients with these comorbidities[11].

The lack of significant symptoms in many cases also raises the question of whether routine screening for SCH in the elderly should be implemented universally or targeted toward high-risk groups. Current guidelines remain divided on this issue, with some recommending screening only for symptomatic individuals or those with risk factors [12] .Advanced age (≥70 years) emerged as a significant predictor of SCH, with a prevalence of 27% in this group compared to 18% in those aged 60–69 years. This finding supports the hypothesis that age-related changes in thyroid physiology, including decreased thyroid reserve and increased prevalence of thyroid autoimmunity, contribute to the higher incidence of SCH in older adults[13]. Additionally, increased exposure to medications that interfere with thyroid function, such as amiodarone or lithium, may play a role.The clinical significance of SCH in the elderly remains a topic of debate. While some studies suggest

that SCH may increase the risk of cardiovascular events, cognitive decline, and progression to overt hypothyroidism, others argue that mild TSH elevations in the elderly may represent an adaptive response to aging rather than a pathological condition [14]. The findings of this study highlight the importance of individualized decision-making in the management of SCH, taking into account TSH levels, symptom burden, comorbidities, and patient preferences.For patients with mild TSH elevations and no symptoms, a "wait-and-see" approach with periodic monitoring may be appropriate [15]. However, for those with higher TSH levels (>7 mIU/L) or significant comorbidities, treatment with levothyroxine may be considered to mitigate potential risks.This study provides valuable insights into the prevalence and clinical characteristics of SCH in elderly hospital patients [16]. However, its cross-sectional design limits the ability to assess causality or progression to overt hypothyroidism. Additionally, the sample size of 125 patients, while sufficient for prevalence estimation, may limit the generalizability of findings to larger populations or community settings.

CONCLUSION

It is concluded that subclinical hypothyroidism is a prevalent condition among elderly hospital patients, affecting 20.8% of the study population, with a higher prevalence in females and those aged 70 years or older. Although often asymptomatic, its association with comorbidities such as hypertension and cardiovascular disease underscores the importance of targeted screening in high-risk groups. Individualized management strategies are essential to address the unique needs of this population effectively.

REFERENCES

1. Pearce SHS, Brabant G, Duntas LH, Monzani F, Peeters RP, Razvi S, et al. 2013 ETA guideline: management of subclinical hypothyroidism. Eur Thyroid J. 2013;2:215–28. doi:10.1159/000356507.
2. Arem R, Escalante DA, Arem N, Morisset JD, Patsah W. Effect of L-thyroxine therapy on lipoprotein fractions in overt and subclinical hypothyroidism with special reference to lipoprotein(a). Metabolism. 1995;44:1559–63. doi:10.1016/0026-0495(95)90075-6.
3. Kung AW, Pang RW, Janus ED. Elevated serum lipoprotein(a) in subclinical hypothyroidism. Clin Endocrinol (Oxf). 1995;43:445–9. doi:10.1111/j.1365-2265.1995.tb02616.x.
4. Canaris GJ, Manowitz NR, Mayor G, Ridgway EC. The Colorado thyroid disease prevalence study. Arch Intern Med. 2000;160:526–34. doi:10.1001/archinte.160.4.526.
5. Tanis BC, Westendorp RGJ, Smelt AHM. Effect of thyroid substitution on hypercholesterolaemia in patients with subclinical hypothyroidism: a reanalysis of intervention studies. Clin Endocrinol (Oxf). 1996;44:643–9. doi:10.1046/j.1365-2265.1996.739560.x.
6. Nagasaki T, Inaba M, Kumeda Y, Hiura Y, Shirakawa K, Yamada S, et al. Increased pulse wave velocity in subclinical hypothyroidism. J Clin Endocrinol Metab. 2006;91:154–8. doi:10.1210/jc.2005-1342.
7. Monzani F, Caraccio N, Kozakowa M, Dardano A, Vittone F, Virdis A, et al. Effect of levothyroxine replacement on lipid profile and intima-media thickness in subclinical hypothyroidism: a double-blind, placebo-controlled study. J Clin Endocrinol Metab. 2004;89:2099–106. doi:10.1210/jc.2003-031669.
8. Biondi B, Fazio S, Palmieri EA, Carella C, Panza N, Cittadini A, et al. Left ventricular diastolic dysfunction in patients with subclinical hypothyroidism. J Clin Endocrinol Metab. 1999;84:2064–7. doi:10.1210/jcem.84.6.5733.
9. Kahaly GJ. Cardiovascular and atherogenic aspects of subclinical hypothyroidism. Thyroid. 2000;10(8):665–79. doi:10.1089/10507250050137743.
10. Brenta G, Mutti LA, Schnitman M, Fretes O, Pezzone A, Matute ML. Assessment of left ventricular diastolic function by radionuclide ventriculography at rest and exercise in subclinical hypothyroidism, and its response to L-thyroxine therapy. Am J Cardiol. 2003;91:1327–30. doi:10.1016/S0002-9149(03)00322-9.
11. Hak AE, Pols HAP, Visser TJ, Drexhage HA, Hofman A, Witteman JCM. Subclinical hypothyroidism is an independent risk factor for atherosclerosis and myocardial infarction in elderly women: the Rotterdam study. Ann Intern Med. 2000;132:270–8. doi:10.7326/0003-4819-132-4-200002150-00004.
12. Surks MI, Ortiz E, Daniels GH, Sawin CT, Col NF, Cobin RH, et al. Subclinical thyroid disease: scientific review and guidelines for diagnosis and management. JAMA. 2004;291:228–38. doi:10.1001/jama.291.2.228.
13. Tunbridge WMG, Evered DC, Hall R, Appleton D, Brewis M, Clark F, et al. The spectrum of thyroid disease in a community: the Wickham survey. Clin Endocrinol (Oxf). 1977;7:481–93. doi:10.1111/j.1365-2265.1977.tb01340.x.
14. Lechner MG, Vyas CM, Hamnvik OR, Alexander EK, Larsen PR, Choueiri TK, et al. Risk factors for new hypothyroidism during tyrosine kinase inhibitor therapy in advanced nonthyroidal cancer patients. Thyroid. 2008;28(4):437–44. doi:10.1089/thy.2017.0579.
15. Parle JV, Franklyn JA, Cross KW, Jones SC, Sheppard MC. Prevalence and follow-up of abnormal thyrotropin (TSH) concentrations in the elderly in the United Kingdom. Clin Endocrinol (Oxf). 1991;34:77–83. doi:10.1111/j.1365-2265.1991.tb01739.x.
16. Jukić, T., Vidranski, V., Blažeković, I., Prpić, M., Jakšić, I., Pourmodjib, K., Mihaljević, I., Franceschi, M., Fröbe, A., & Kusić, Z. (2002). THE PREVALENCE OF SUBCLINICAL HYPOTHYROIDISM IN THE POPULATION OF ELDERLY NURSING HOME RESIDENTS IN ZAGREB. *Acta Clinica Croatica*, *61*(1), 38. https://doi.org/10.20471/acc.2002.61.01.05